Appendix E

- **National Periodic Monitoring Memo**
- **CAM Q&As**
- **California/Region 9 Periodic Monitoring Recommendations**

September 15, 1998

MEMORANDUM

SUBJECT: Periodic Monitoring Guidance for Title V Operating Permits Programs

FROM: Eric V. Schaeffer, Director /s/
Office of Regulatory Enforcement (2241-A)

John S. Seitz, Director /s/
Office of Air Quality Planning and Standards (MD-10)

TO: Addressees

Attached is the Periodic Monitoring Guidance for the Clean Air Act's title V operating permits programs. Our offices, acting in concert with Region VII, as lead Regional Office, and the Office of General Counsel, developed this guidance to address questions and concerns raised by State and local permitting authorities. The clarifications provided in this guidance should speed permit application development, as well as draft and proposed permit review.

Please share this guidance with permitting authorities and applicants in your jurisdiction. As mentioned in the guidance, specific questions should be directed to Regional title V permitting personnel. This guidance is also available on EPA's TTN web site at www.epa.gov/ttn/oarpg/tvmain.html.

Finally, we want to thank Region VII for its leadership in coordinating Regional views on this topic.

Attachment

Addressees:
Director, Office of Environmental Stewardship, Region I
Director, Office of Ecosystem Protection, Region I
Director, Division of Enforcement and Compliance Assurance, Region II
Director, Division of Environmental Planning and Protection, Region II
Director, Air Protection Division, Region III
Director, Air, Pesticides, and Toxics Management Division, Region IV
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cc: T. Curran
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Periodic Monitoring Guidance

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I. Introduction

Many State and local permitting authorities have begun issuing title V operating permits. One of the most challenging aspects of this process has been the "periodic monitoring" requirement of the Environmental Protection Agency's (EPA's or Agency's) rules implementing title V, codified at title 40 of the Code of Federal Regulations (40 CFR), part 70. The issues raised have sometimes revealed significantly different interpretations of this requirement among permitting authorities, EPA, and permitted sources. On several occasions, EPA Regions have objected to permits because the periodic monitoring provisions were lacking or inadequate. It is likely that understanding of the technical aspects of implementing periodic monitoring will continue to evolve over time. However, EPA believes this is an appropriate time for issuance of guidance that addresses certain basic principles, necessary for adequate periodic monitoring.

The purpose of this guidance is to clarify certain principles to be applied when implementing the periodic monitoring requirements contained in 40 CFR, sections 70.6(a)(3) and 71.6(a)(3). Section I provides background on why and when periodic monitoring is necessary. Section II offers a description of the periodic monitoring evaluation process and clarifies important concepts like "relevant time period." Sections III and IV describe how periodic monitoring can be made enforceable through the title V permit and what level of documentation should accompany the permit record. Sections V and VI explain EPA's role in the periodic monitoring evaluation process and where the applicant, the permitting authority, or public may find more information about the process. Section VII describes the effect of this guidance.

A. Periodic Monitoring is Required by the Act and its Implementing Regulations

All title V permits must contain sufficient monitoring, including periodic monitoring, to assure compliance with the applicable requirements in the permit. Section 504 of the Clean Air Act (Act) makes it clear that each title V permit must include "conditions as are necessary to assure compliance with applicable requirements of [the Act], including the requirements of the applicable implementation plan" and "inspection, entry, monitoring, compliance certification, and reporting requirements to assure compliance with the permit terms and conditions." In addition, section 114(a) of the Act requires "enhanced monitoring" at major stationary sources, and authorizes EPA to establish periodic monitoring, record keeping, and reporting requirements at such sources. The regulations at 40 CFR,

sections 70.6(a)(3) and 71.6(a)(3), specifically note that each permit shall contain periodic monitoring sufficient to yield reliable data from the relevant time period that are representative of the source's compliance with the permit where the applicable requirement does not require periodic testing or instrumental or noninstrumental monitoring (which may consist of record keeping designed to serve as monitoring).

It has been and continues to be the Agency's view that sources are under an obligation to comply with permit limits, State implementation plan (SIP) limits, national emissions standards for hazardous air pollutants (NESHAP), and new source performance standards (NSPS) requirements at all times. Consistent with this view of "compliance" and with our stated approach in the compliance assurance monitoring (CAM) rule (40 CFR part 64), we believe that periodic monitoring requirements in title V permits must provide a reasonable assurance of compliance over all anticipated operating conditions.[1]

One of the purposes of the periodic monitoring requirement is to collect and record information that can be used by the source, in conjunction with any other relevant information, to assess that emission point's compliance with applicable requirements. Thus, periodic monitoring requires the actual recording and retention of information related to emissions, not just the displaying of that information at the time it is being generated.

B. Why Periodic Monitoring Is Required

The Act, through the title V program and section 114(a), places the responsibility on source owners and operators to have sufficient knowledge of their source operations to certify whether their emission units are in compliance with all

[1]This guidance interprets sections 70.6(a)(3)'s and 71.6(a)(3)'s requirement that periodic monitoring be sufficient to yield reliable data that are "representative of the source's compliance with the permit" to require the same level of compliance assurance as part 64's requirement that monitoring and monitoring data provide "reasonable assurance of compliance with emission limitations or standards for the anticipated range of operations at a pollutant-specific emissions unit." Both part 70's "representative of compliance" standard and part 64's "reasonable assurance of compliance" standard are reasonable interpretations of the Act, section 504's mandate to include monitoring to "assure compliance" with title V permit terms and conditions. In light of this, this guidance will use the terms "representative of compliance," "reasonable assurance of compliance," and "assure compliance" interchangeably. Moreover, when these terms are used, compliance shall mean continuous compliance.

applicable air pollution control requirements. Periodic monitoring can be used by source operators to quickly identify unusual periods of operation and to take the necessary corrective action. Further, data from periodic monitoring--in conjunction with other required monitoring data and other available information--provide a basis on which a responsible official for a source may certify its compliance status. Data from periodic monitoring are also important to permitting authorities and citizens for the purpose of assessing sources' compliance with applicable requirements.

C. Where Periodic Monitoring is Required

Periodic monitoring is required for each emission point at a source subject to title V of the Act that is subject to an applicable requirement, such as a Federal regulation or a SIP emission limitation. No emission units at a title V source subject to an applicable requirement, including those subject only to generic applicable requirements, are categorically exempt from the requirement that the permit contain monitoring, compliance certification, and reporting provisions to assure compliance with the permit terms and conditions.

For many emission points at most sources, monitoring already exists in current Federal or State regulations that satisfies the part 70 periodic monitoring requirement. First, all new standards proposed under the authority of section 111 NSPS and section 112 NESHAP after November 15, 1990 are presumed to have adequate monitoring to meet the periodic monitoring requirement for those standards. Second, for emission units at major sources that are subject to Federal or SIP emission limitations, or standards for which the Federal standard specifies a continuous compliance determination method,[2] the existing monitoring used to determine continuous compliance is sufficient to meet the title V monitoring requirements [see 62 FR 54899, 40 CFR section 64.1, and 40 CFR section 64.2(b)(1)(vi)]. Third, for emission units subject to the acid rain requirements pursuant to sections 404, 405, 406, 407(a), 407(b), or 410 of the Act, EPA has determined that these regulations contain sufficient monitoring for the acid rain requirements. Therefore, permits incorporating monitoring in the Federal regulations for units subject to any of the above

[2]A continuous compliance determination method means a method specified by the applicable standard which: (1) is used to determine compliance with an emission limitation or standard on a continuous basis, consistent with the averaging period established for the emission limitation or standard; and (2) provides data either in units of the standard or correlated directly with the compliance limit.

identified applicable requirements will not need any additional monitoring for these standards.

In addition, on October 22, 1997, EPA promulgated the CAM rule, 40 CFR part 64, which addresses monitoring for certain emission units at major sources. The CAM rule, which applies only to emission units with active control devices whose potential pre-control device emissions are at or above the major source thresholds, requires the title V permit for these sources to contain monitoring sufficient to give a "reasonable assurance of compliance" with applicable standards for the units subject to CAM. Thus, emission units with an approved CAM plan will have sufficient monitoring to satisfy the periodic monitoring requirement under title V and part 70. In other words, although units subject to part 64 are also subject to part 70's periodic monitoring requirement, an adequate CAM plan will also satisfy the periodic monitoring requirements of part 70 for those emission units covered by the CAM plan.

The CAM rule generally will not require implementation of its requirements for most units subject to CAM until the first round of title V permit renewals, which will generally be 5 years after initial permit issuance. Therefore, until emission units become subject to the requirements of part 64, the initial title V permit for major sources with units subject to Federal or SIP regulations will need to include periodic monitoring for these CAM units. The most obvious periodic monitoring for these units in this interim period before permit renewal would be to begin to establish monitoring based on CAM principles as the units' method of complying with part 70's monitoring requirements. These units, however, may also use periodic monitoring that is not based on CAM principles as periodic monitoring, but only until 40 CFR part 64 becomes applicable to the unit and only to the extent that the monitoring reasonably assures compliance.

If an emission unit does not fall within one of the general categories identified in the previous three paragraphs, periodic monitoring is required when the applicable requirement does not require periodic testing or instrumental or noninstrumental monitoring sufficient to yield reliable data from the relevant time period that are representative of the source's compliance with the permit. Clearly, when an applicable requirement imposes a one-time testing requirement, periodic monitoring is not satisfied, and so additional monitoring must be required consistent with sections 70.6(a)(3) or 71.6(a)(3). In addition, additional periodic monitoring may be necessary in cases where some monitoring exists in an applicable requirement, but such monitoring does not provide the necessary assurance of compliance. Further, if an applicable requirement lacks

monitoring or testing, periodic monitoring is not satisfied unless the unit is an insignificant emissions unit (IEU) for which no additional monitoring may be necessary, as discussed in section II.F below.

In light of the general categories above for which periodic monitoring requirements are already satisfied, emission units subject to pre-1990 NSPS and NESHAP regulations and emissions units subject to specific SIP standards or permit terms created under SIP-approved programs should be examined for determining whether the applicable requirement's existing monitoring is sufficient to assure compliance or whether additional monitoring is necessary to satisfy part 70's periodic monitoring requirement.

II. The Periodic Monitoring Evaluation Process

Periodic monitoring must be adequate to provide a reasonable assurance of compliance with requirements applicable to the source and with all permit terms and conditions over the anticipated range of operation. As described above, periodic monitoring must be evaluated and established as appropriate for each applicable requirement for which the present monitoring is nonexistent or otherwise inadequate. In many cases, this will require a case-by-case, unit-by-unit, pollutant-by-pollutant analysis to devise an adequate monitoring scheme. However, in other cases, it may be appropriate to simply evaluate periodic monitoring for a "like" class of emission units and applicable requirements. Monitoring for "like" situations is described further in section II.F below.

The periodic monitoring process should begin by evaluating whether monitoring, including record keeping, reporting, or periodic testing, applies to the emissions unit in question under existing applicable requirements for that unit. If the already-required monitoring is sufficient to yield reliable data from the relevant time period and is representative of the source's compliance with a particular applicable requirement, then no further monitoring––for that applicable requirement at that emission unit––is required in the permit. If additional monitoring is required, then the permitting authority should consider all of the relevant factors listed below, as well as other factors that may apply on a case-by-case basis, in order to arrive at the appropriate periodic monitoring methodology.

Those factors include:

- The likelihood of violating the applicable requirement (i.e., margin of compliance with the applicable requirement);
- Whether add-on controls are necessary for the unit to meet the emission limit;
- The variability of emissions from the unit over time;
- The type of monitoring, process, maintenance, or control equipment data already available for the emission unit;
- The technical and economic considerations associated with the range of possible monitoring methods; and
- The kind of monitoring found on similar emission units.

While EPA does not plan to specify any particular protocol in implementing periodic monitoring, the preceding factors provide an outline of how to analyze what is appropriate periodic monitoring for an emission unit with a particular applicable standard. The process is informed at each step by the underlying purpose of periodic monitoring, to provide a reasonable assurance of compliance with the applicable requirement for the anticipated range of operations.

In all cases, the rationale for the selected periodic monitoring method must be clear and documented in the permit record. In many cases, the effectiveness of the periodic monitoring technique will be obvious--as in the case of continuous emissions monitoring--and will require little additional documentation in the administrative record. At other times, a technical justification may be necessary in the permit record. Overall, it is important for permitting authorities to properly document the permit record for reference in future title V permitting actions.

Examples of how these and other factors should be considered in the periodic monitoring selection process are described throughout the remainder of the guidance. In particular, Sections II.B through II.F discuss many of the different types of activities that can constitute periodic monitoring for different applicable requirements. The discussion of these different monitoring options should not suggest, however, that there is a hierarchy to deciding what periodic monitoring is appropriate.

A. The Relevant Time Period for Periodic Monitoring

For the purposes of this guidance, "relevant time period" from 40 CFR section 70.6(a)(3) and 40 CFR section 71.6(a)(3) is clarified to mean "*the averaging period of the applicable requirement.*" The "relevant time period" is not to be confused with the semi-annual reporting and annual compliance certification cycles also found in parts 70 and 71. For example, the relevant time period for many opacity requirements is 6 minutes. If an applicable requirement measures compliance with an SO_2 emission limit pursuant to a rolling 30-day average, then the relevant time period is a rolling 30-day period. In some cases, the applicable requirement may not expressly state an averaging time. For example, 40 CFR part 60,subpart O limits particulate matter to 0.65 g/kg of dry sludge. However, the standard specifies that Method 5 shall be used and specifies the sampling time and volume for each run. In this example, the relevant time period would be the cumulative sampling time needed to perform the Method 5 test (e.g., 3 hours representing the cumulative sampling time of three 1-hour runs). In some cases the relevant time period is instantaneous. For example, if a work practice standard requires a lid to be free of holes or cracks, a violation exists if the lid has a hole or crack for any amount of time.

However, it is important to note that the duration of periodic monitoring, in many instances, will not match the relevant time period of the applicable requirement. Instead, the duration of the monitoring simply needs to allow the results of the monitoring to relate to, that is, to provide an assurance of compliance during, the relevant time period. In this way, the requirement that periodic monitoring data be from the "relevant time period" is closely related to the requirement that the data be "representative of compliance." Data are "representative of compliance" if they allow for a reasonably supportable conclusion regarding the compliance status during each relevant time period.

For example, suppose that a boiler is subject to an SO_2 limit with a 1-hour averaging time and the source is using a low sulfur oil that would assure compliance with the limit. The periodic monitoring might consist of testing the oil purchased by the source. In this example, although the "relevant time period" is one-hour, it is obvious that neither the sampling nor analysis of the oil must occur for the full hour. Instead, it is clear that the results of an analysis of the sulfur content of a representative oil sample relate to the 1-hour averaging period of the limit for that fuel shipment, provided that the sulfur content is consistent.

Furthermore, periodic monitoring does not require that every "relevant time period" be monitored. Instead, the frequency of the monitoring would be determined during the periodic monitoring evaluation process. Take the example of a flare that is subject to the requirements of 40 CFR section 60.18. The design requirements at section 60.18(c)(1) require that the flare be designed for and operated with no visible emissions except for periods not to exceed a total of 5 minutes during any 2 consecutive hours. Compliance is determined by using Reference Method 22 with an observation period of 2 hours. Performing a Method 22 for every 2-hour period is neither practical nor necessary.

B. Use of Existing Continuous Emissions Monitors

Several Federal rules, including certain NSPS and NESHAP subparts and Acid Deposition Control, already require source operators to install, maintain, operate, and quality assure continuous monitoring devices to directly measure emissions. Similarly, many SIPs and construction permits require such devices. Where the source has already installed a continuous emission monitoring system (CEMS), a predictive emission monitoring system (PEMS), or a continuous opacity monitoring system (COMS), such systems will be the periodic monitoring method except in highly unusual circumstances.

For example, most coal fired utility boilers are required to install, operate, maintain, and quality assure SO_2, NO_x, and CO_2 flow, and opacity monitoring equipment under the acid rain program. These monitoring systems are to be operated during all periods of operation, including periods of startup, shutdown, and malfunction, and during times when alternative fuels may be combusted. In these cases, the existing monitoring systems are to be specified as the periodic monitoring method for applicable requirements under the SIP and other requirements such as the NSPS. In nearly all cases, data from these monitoring systems provide the fundamental building blocks for determining compliance with different emissions limits and averaging times, at little or no additional cost. Further, since the acid rain program requires these monitoring systems to be operated at all times, including periods of time when the unit is combusting alternative fuels, the monitoring systems provide useful information that the source may use to verify compliance with the standards.

While it may be technically possible to craft different monitoring scenarios for each different operating condition, the permitting authority should strive to minimize confusion where possible. For example, even though opacity and SO_2 emissions

will likely never exceed the corresponding emission limitations when a coal-fired utility unit fires natural gas during periods of startup, shutdown, malfunction, or coal curtailment, data on opacity and SO_2 emissions should still be supplied during those periods using the COMS and SO_2 CEMS. The use of a single, standardized monitoring methodology allows the source, State and local agencies, EPA, and the general public to evaluate one set of compliance data.

C. When Existing Testing or Monitoring is Inadequate

Part 70 requires an evaluation of a permit's applicable requirements to determine whether monitoring in these requirements meets the periodic monitoring criteria and is, therefore, adequate to provide a reasonable assurance of compliance with the applicable requirement over the anticipated range of operations. Whether existing monitoring is adequate, therefore, must be judged according to the periodic monitoring criteria, namely whether the monitoring yields reliable data from the relevant time period that are representative of the source's compliance with the applicable requirement. A different interpretation would lead to the anomalous and unacceptable result that an applicable requirement that lacked monitoring altogether would be supplemented to a greater degree in the title V permit than an applicable requirement with monitoring that is minimal and inadequate.

In general, existing testing or monitoring is inadequate if the data are not reliable, if the data collection frequency is not specified, or if the data collected are not representative of the emission unit's compliance performance. Where the applicable requirement does not contain adequate monitoring, reporting, or record keeping to provide a reasonable assurance of compliance for the anticipated range of operations, periodic monitoring must be added to fulfill the requirements of 40 CFR sections 70.6 and 71.6.

While reference method tests and emission factors all play an important role in the air pollution control program, none of these methods constitutes periodic monitoring unless it provides reliable information at a frequency sufficient to provide a reasonable assurance of compliance with the applicable requirement. For example, a once-a-year stack test is not sufficient to assure compliance with a 3-hour emission limitation unless the source can provide additional parametric data to provide a reasonable assurance of compliance with the standard. Likewise, while AP-42 or other emission factors are helpful for estimating emission levels, they are generally not appropriate for determining compliance with an applicable requirement unless

the factor has either been developed directly from the emission unit in question or substitutes for a proven mass-balance relationship. Further, monthly fuel sampling and analysis also may not be adequate for short-term emission limits where the fuel composition varies. In the event the permitting authority determines that shorter-term monitoring is technically infeasible or cost prohibitive, a less frequent sampling frequency may be established as long as the period is sufficiently representative of the source's compliance with the emission limitations. Otherwise, additional monitoring must be used to show compliance between stack tests.

D. CEMS, PEMS, or COMS Should be Considered When Developing Periodic Monitoring

The permitting authority should give consideration to requiring installation, operation, maintenance, and quality assurance of CEMS, PEMS, or COMS for vents or stacks which carry a major portion of the plant's emissions and have an applicable requirement that the emission unit is likely to exceed. In addition, any other equipment for which an NSPS establishes a CEMS, PEMS, or COMS requirement–-whether or not that equipment is subject to the NSPS–-should be considered candidates for emission monitors.[3] Note that even where CEMS, PEMS, or COMS are technically and economically feasible, other periodic monitoring may be selected consistent with the relevant factors in section II of this guidance.

E. Use of Parametric Monitoring

Parametric monitoring that provides a reasonable assurance of compliance should be considered for periodic monitoring. The CAM rule should be consulted for guidance on the type of parametric monitoring that might satisfy periodic monitoring.

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[3]For example, through its NSPS program, EPA has already determined that COMS are both technically and economically feasible for a large number of emission units, including industrial, institutional, commercial, and utility steam boilers firing other than natural gas or "clean" fuel oil; fluidized catalytic cracking units; portland cement kilns and clinker coolers; primary metal smelters; ferroalloy and steel arc furnaces; pulp mill recovery furnaces; glass melting furnaces; rotary lime kilns; and phosphate rock and other mineral dryers, calciners, and grinders. Similarly, the NSPS establish SO_2, NO_x, H_2S, and other continuous monitoring requirements for a variety of emission units. The above list is not meant to limit the source types for which monitors may be appropriate, but instead provides examples of the source types for which monitors are known to be both technically and economically feasible.

Information on parameter data that the source is already collecting and that could be used to indicate compliance should be considered.

When using parametric data to satisfy the periodic monitoring requirement, the permit should specify a range which will provide a reasonable assurance that the source is in compliance with the underlying requirement. Wherever possible, the proposed range should be supported by documentation indicating a site-specific developed relationship between parameter indicator ranges and compliance with the emission limit, although it is not required that the range be set such that an excursion from the range will prove noncompliance with the associated limit. Operational data collected during performance testing is a key element in establishing indicator ranges; however, other relevant information in establishing indicator ranges would be engineering assessments, historical data, and vendor data. The permit should also include some means of periodically verifying the continuing validity of the parameter ranges.[4]

For example, the permit may require periodic stack testing to verify direct compliance with the applicable requirement. At the same time, the test data and other engineering information could be used to set the parameter ranges that will be used to determine compliance between tests. The permit should also specify what happens when a parameter exceeds the established range. For example, the permit should specify whether excursion from the established range is considered a violation or whether it will instead trigger corrective action and/or additional monitoring or testing requirements to determine the compliance status of the source. Where documentation of a site-specific developed relationship between parametric monitoring and compliance with the emission limit is not possible because data are lacking and because generation of such data are not feasible prior to issuance of the permit, it may be necessary to include in the permit milestones, including source testing, for

[4]The discussion of parametric monitoring for compliance purposes in this document is necessarily brief. More complete discussions, including examples and illustrations, of compliance assurance monitoring principles, parametric monitoring designs, and appropriate justifications are available in the CAM rule (40 CFR part 64) and the CAM Technical Guidance Document. Both of these documents as well as other related materials are available electronically through the Emission Measurement Center site on EPA's Technology Transfer Network (www.epa.gov/ttn/emc). Responses to specific questions about the CAM rule and related material are available through the emission testing information hotline, The Source, at (919) 541-0200.

establishing such relationship. The EPA expects this will only rarely be the case.

F. Other Forms of Periodic Monitoring, Including Record Keeping and Permit Limitations

The Agency recognizes that periodic monitoring may take many forms other than the direct measurement of emissions or parametric monitoring, including record keeping and permit limitations. As stated earlier in this guidance, the conclusion about what is appropriate periodic monitoring should be reached by analyzing all relevant factors in section II of this guidance for each emission unit and each applicable requirement.

The maintenance of records, whether emission calculations, fuel content information, or some other relevant information, may be sufficient periodic monitoring for certain emission units, and applicable requirements. For example, record keeping of required work practices, pollutant content of fuel or raw material, and inspections of design or equipment specifications may satisfy periodic monitoring depending on the applicable requirements and the type of emission units.

As an example, many state rules establish particulate matter limitations based on a process-weight-rate table or formula. In cases where these limits can be met with minimal or no controls, it may be acceptable for the permitting authority to specify record keeping as adequate periodic monitoring because the likelihood that the source will exceed the emission limitation, even while operating at full load, is extremely low. In this case, retaining information on the material inputs to the process would constitute adequate periodic monitoring. Of course, if some level of control is necessary to comply with the standard, then the permit must either specify frequent measurement of particulate matter and/or collection of control equipment parameters to assure proper operation and maintenance of the control device.

Similarly, an enforceable permit limitation may constitute adequate periodic monitoring in the proper circumstances. For example, a permitting authority may conclude that the likelihood of violating an SO_2, particulate matter, or opacity emission standard for gas combustion units firing pipeline grade natural gas is virtually impossible as long as the unit is properly maintained and burns pipeline grade natural gas. Thus, appropriate periodic monitoring for this situation might consist of maintaining adequate records of fuel type and making the fuel type and the proper maintenance of the unit enforceable conditions of the permit. The EPA believes that there are many

other combinations of requirements, emission units, raw materials and fuels, in addition to the two examples above, where record keeping and/or permit restrictions would satisfy the periodic monitoring requirement.

In situations where a particular class of "like" applicable requirements associated with "like" emission units would all require the identical periodic monitoring (e.g., all natural gas fired boilers needing record keeping to provide a reasonable assurance of compliance with a 20 percent opacity standard), a permitting authority may, after adequate justification, determine the periodic monitoring for that class of units. Of course, if a particular source is found to differ from such a class due to a history of inconsistent operating conditions or difficulties in providing a reasonable assurance of compliance, for example, then class treatment may not be appropriate. Permitting authorities may opt to create a policy or other guidance document explaining the class treatment and rationale for use in all subsequent permitting actions. Any such policy should be made readily available to the public and other interested parties, including EPA.[5]

Although periodic monitoring may consist of record keeping and/or a permit limitation such as a fuel restriction, in no case will EPA accept a periodic monitoring determination based solely on the size, hours of operation, or the past compliance history of the emission unit. Operational and process flexibility, changes in ownership, fuel flexibility, age of unit, and many other factors can adversely influence a source's future compliance status, despite its past good performance. Of course, information on past compliance history is relevant to the likelihood of violating the applicable standard (one of the six factors discussed previously in this guidance) and will help inform the source and permitting agency on the appropriate monitoring to provide a reasonable assurance of compliance.

The EPA also acknowledges that there may be a small class of IEU's for which no additional monitoring may be necessary. While discussing IEU's subject to generally applicable requirements, White Paper Number 2 for Implementation of The Part 70 Operating Permits Program states that where the establishment of a regular program of monitoring would not significantly enhance the ability of the permit to assure compliance with the general applicable requirement, the permitting authority can provide that the status

[5]Although any such policy will undergo formal review by EPA only when presented in the context of a particular title V permit, advanced coordination with and review by EPA is encouraged.

quo (e.g., no monitoring) will meet the requirements of section 70.6(a)(3)(i). This is based on the belief that IEU's typically are associated with inconsequential environmental impacts and present little potential for violations of generically applicable requirements.

Of course, where a potential for violation of the applicable requirement exists, the permitting authority shall consider adding monitoring requirements. For example, a small coal and natural gas-fired boiler (an IEU in some programs) may need monitoring for opacity while the unit is burning coal to provide a reasonable assurance of compliance with the SIP's opacity limit, while a large turbine that is major for NO_x and that can only burn pipeline natural gas, may not need monitoring for the SIP's opacity or SO_2 limit. It should be emphasized that whether a reasonable assurance of compliance is achieved without additional monitoring must be judged in the context of a particular emission unit, or as discussed above, a class thereof. That a unit was approved as an "insignificant activity" by EPA relates to the level of detail necessary to be included in a title V permit application and not whether compliance with any applicable requirement is assured without further monitoring. The fact that a unit is an IEU is not, by itself, a justification for no monitoring.

III. Enforceability of Periodic Monitoring Provisions

Vague or unenforceable monitoring requirements in permits are not sufficient to address the requirement for periodic monitoring. For example, statements in the permit that the source shall prepare a monitoring plan, that testing shall be performed at the request of the permitting authority, or that the permitting authority's inspectors will conduct the periodic monitoring for the source are not sufficient. Responsibility for compliance with the title V permit rests upon the source. Therefore, permit conditions that rely on a permitting agency to conduct periodic monitoring are not enforceable. While permitting authorities may conduct frequent inspections or compliance tests for certain sources as part of the permitting authorities' general compliance program, the source cannot guarantee that this practice will continue in the future, or that it will provide adequate data to assure compliance with all applicable requirements. Additionally, the source is in a better position to detect and correct changes in normal operations before they become violations.

Monitoring methods approved by the permitting authority must result in information that is enforceable as a practical matter. For example, if monitoring and recording the usage of fuel is the

method chosen by the permitting authority for determining compliance with an emission limit, the data must be collected at a frequency so as to allow a presumption of compliance on the part of the source. Permitting authorities can assure such practical enforceability by confirming that the following elements are identified in the title V permit for each monitoring approach where appropriate: the frequency of monitoring, the data averaging period used, the procedures used to check data validity, the minimum period that data must be available, the requirements for record keeping, and the requirements to provide prompt deviation and summary reports.

IV. Periodic Monitoring and the Permit Public Record

The periodic monitoring in each permit must be supported by the permit record. Discussion of the decisions the permitting authority makes related to monitoring may appear in the statement that sets forth the legal and factual basis for the draft permit required by section 70.7(a)(5) or may be documented elsewhere in the permit record, including the permit application if the permitting authority finds the periodic monitoring methodologies proposed by the source are adequate. The rationale for periodic monitoring decisions that require substantial explanation should be put in documents other than the formal title V permit. This approach allows inspectors, sources, and other interested readers to focus on the actual requirements of the permit rather than having to evaluate background materials.

V. EPA's Role

The EPA in general, and Regional Offices in particular, will continue to provide technical assistance to permitting authorities to assure that adequate monitoring exists in permits. Further, the Regions will continue to evaluate whether the public records for periodic monitoring decisions are complete and technically sound. While EPA respects the role of the permitting authority as the primary implementer of the title V permit program, the Agency has a responsibility to maintain oversight to help ensure consistency in implementing the requirements and to fulfill EPA's role in assuring compliance with applicable requirements of the Act. The Regions should work with permitting authorities to resolve any periodic monitoring deficiencies expeditiously and at an early stage. However, the Regional Offices may object to a permit that is lacking adequate periodic monitoring if no other resolution can be reached prior to the end of EPA's 45-day review period.

While periodic monitoring by nature may be very source specific, the Regional Offices have a responsibility to ensure a

level of broad consistency in how different permitting authorities implement periodic monitoring. Therefore, the Regions will continue to coordinate reviews of periodic monitoring. The EPA expects that understanding of the technical aspects of periodic monitoring will evolve. Accordingly, EPA views consistency as a goal that must be achieved over time.

The EPA's limited resources do not allow it to review all permits or all proposals for periodic monitoring. Given the Agency's constraints in reviewing all proposed permits, EPA will concentrate its efforts on periodic monitoring associated with those emission units that have uncontrolled or pre-control potential emissions equivalent to or in excess of the major source threshold for the pollutant of interest. In addition, EPA will focus on non-major units that utilize control devices, non-major emission units that involve environmental justice concerns, those units that are located in a particular area where non-major emission units significantly impact air quality or have toxic emissions that could impose significant risks to public health, those units for which the public raised significant concern during the comment period, and those units for which the proposed title V permit contains no monitoring.

VI. For More Information

Source representatives with specific questions about periodic monitoring should first contact their local or state permitting authority. If appropriate, the permitting authority may then wish to involve the Regional Office in discussions on periodic monitoring. On the whole, permitting authorities should feel free to discuss any periodic monitoring issues with their EPA Regional Office.

Those interested in periodic monitoring developments may also want to periodically visit the various EPA Headquarters and Regional Office web sites for specific details on periodic monitoring. Many regions have been working with their state and local permitting authorities to improve the process and are making objection letters and other guidance and policy documents available to the public through the Internet.

VII. Effect of This Guidance

While offering specific recommendations, this guidance is not intended to prescribe or prohibit periodic monitoring for specific applicable requirements or emissions sources. The policies set forth in this paper are intended solely as guidance, do not represent final Agency action, and cannot be relied upon to create any rights enforceable by any party. The Agency may choose to issue more detailed, technical guidance in the future. Further, this guidance does not address and in no way affects use of periodic monitoring data under the Credible Evidence Revisions (see 62 FR 8314). Finally, nothing in this guidance is intended to limit EPA's authority and ability to object to periodic monitoring that the Agency determines to be inadequate or otherwise not in compliance with part 70.

Frequently Asked Questions (FAQs) Concerning the
Compliance Assurance Monitoring (CAM) Rule

The following questions and responses concerning implementation of the Compliance Assurance Monitoring (CAM) Rule are arranged in three groups. The first group contains general background information about the CAM package. The second group contains specific information related to the CAM rule, and the third group contains information related to the changes in operating permit program rules brought about by the CAM rule.

General Background Information

Question 1. When will the rule take effect?

Response 1. The rule is effective November 21, 1997, which is thirty days after the Federal Register publication date of October 22, 1997. This means that the changes to parts 70 and 71 are effective on November 21, 1997. See 62 FR 54900. Even though the effective date has occurred, **most owners and operators will not need to submit CAM plans until renewal of their initial permits**. However, owners or operators of existing or new large pollutant specific emission units (PSEUs) - those whose post-control emissions exceed or are equivalent to the major source threshold - that do not have complete permit applications by April 20, 1998 - which is 180 days after publication of the rule in the Federal Register - will need to include CAM plans as part of their permit applications. See section 64.5(a) and (b).

Chart I shown below contains the CAM plan due dates. Note that the term "other unit" means a unit whose post-control emissions are less than the major source threshold.

Chart I. CAM Plan Due Dates

Pollutant Specific Emission Unit (PSEU) Size	**CAM Plan Due as Part of the Operating Permit INITIAL Application**	**CAM Plan Due as Part of the Operating Permit REVISION Application**	**CAM Plan Due as Part of the Operating Permit RENEWAL Application**
Large	If permit application is not complete by 4/20/98 OR if PSEU part of a greenfield permit application after 4/20/98	If a significant permit revision at an existing title V source	If application is complete before 4/20/98
Other	Never	Never	Always

Question 2. How many pollutant specific emission units will be covered?

Response 2. The CAM rule will affect about 27,000 PSEUs (about 3,000 large PSEUs and 24,000 other PSEUs) at about 9,000 sources. See 62 FR 54905. Preparation of CAM plans for about forty percent of these units should be easier, since these units already use monitoring acceptable for CAM purposes. See Table IV-27, Regulatory Impact Analysis.

CAM Rule Information

Question 3. What kind of equipment is affected by the CAM rule?

Response 3. The CAM rule applies to each PSEU that meets a three-part test. The PSEU must:

a. be subject to an emission limitation or standard, and
b. use a control device to achieve compliance, and
c. have pre-control emissions that exceed or are equivalent to the major source threshold.

Note that the term "control device" means equipment, other than inherent process equipment, that is used to destroy or remove air pollutant(s) prior to discharge to the atmosphere. The term "control device" does not include passive methods such as lids or seals or inherent process equipment provided for safety or material recovery. See section 64.2(a).

Question 4. What kinds of equipment were excluded from the CAM rule? Why were exclusions granted?

Response 4. The following PSEUs are excluded from the CAM rule:

a. those subject to 111 or 112 standards promulgated after 11/15/90, since those standards have been and will be designed with monitoring that provides a reasonable assurance of compliance;
b. those subject to the acid rain program, emissions trading programs such as the acid rain program, emissions caps like those provided in the Intel P4 permit, or continuous compliance determination methods, i.e., where a regulatory requirement specifies a monitoring method for compliance, because CAM is believed to be redundant for these units [note that permitting authorities should ensure that these units have or get monitoring sufficient for trading emission credits in the proper currency]
c. certain municipally-owned utility units, as defined in 40 CFR 72.2, that produce electricity during periods of peak electrical demand or emergency situations since these periods or situations are infrequent.

See section 64.2(b).

Question 5. What does the CAM rule require of owners and operators?

Response 5. The CAM rule aims to have owners and operators maintain their control devices at the levels that assure compliance. The rule allows owners and operators to design CAM plans on current requirements and operating practices, to select representative parameters upon which compliance can be assured, to establish indicator ranges - or procedures for setting the indicator ranges - for the parameters, to use performance testing and other information to verify the parameters and ranges, and to correct control device performance problems as expeditiously as practicable. See sections 64.3 and 64.7.

Question 6. What are the elements of a CAM plan?

Response 6. A CAM plan must:

a. Describe the indicators to be monitored;
b. Describe the ranges or the process to set indicator ranges;
c. Describe the performance criteria for the monitoring, including
   - specifications for obtaining representative data
   - verification procedures to confirm the monitoring's operational status
   - quality assurance and control procedures
   - monitoring frequency
     4 times per hour (minimum) if post control emissions are equal to or exceed the major source threshold
     1 time per day (minimum) if post control emissions are less than the major source threshold
   - data averaging period;
d. Provide a justification for the use of parameters, ranges, and monitoring approach;
e. Provide emissions test data; and, if necessary,
f. Provide an implementation plan for installing, testing, and operating the monitoring.

See section 64.4.

Note that permits are required to have the following items:

a. The approved monitoring approach, including the indicators - or the means to measure the indicators - to be monitored;
b. A definition of exceedences or excursions;
c. The duty to conduct monitoring;
d. Minimum data availability and averaging period requirements; and
e. Milestones for testing, installation, or final verification.

See section 64.6(c).

Question 7. What guidance / outreach is planned for this rule?

Response 7. The OAQPS has released a draft CAM Technical Guidance Document that describes the rule implementation process, includes example control device monitoring illustrations, and has case studies from actual situations. The Technical Guidance Document can be found on the Technology Transfer Network at "http:\\134.67.104.12\html\emtic\cam.htm".

The illustrations show a way of meeting the CAM requirements by identifying a control method and monitoring approach for a specific pollutant. Additional CAM illustrations are under consideration, including wet scrubbers for sulfur dioxide, carbon adsorbers for volatile organic compounds, selective catalytic reduction for nitrogen oxides, flares for carbon monoxide, and electrostatic precipitators for particulate matter. In addition, the Emission Measurement Center and AWMA plan on sponsoring a number of workshops beginning in January. A series of satellite broadcasts is also planned to aid permitting authorities in reviewing permit applications.

An example CAM illustration for particulate matter control using a fabric filter is shown in Chart II.

Chart II. Example CAM Illustration

EXAMPLE COMPLIANCE ASSURANCE MONITORING PLAN: FABRIC FILTER FOR PM CONTROL

I. Background

A. Emissions Unit

Description: Line 3 Particleboard Sander
Identification: M2
Facility: One Facility in Anytown, USA

B. Applicable Regulation, Emission Limit, and Monitoring Requirements

Regulation No.: OAR 340-21, permit
Emission limits:
Particulate matter: 0.1 gr/dscf, 3 hr avg.
Monitoring requirements: Visible emissions, periodic monitoring (M22)

C. Control Technology

Pulse-jet baghouse operated under negative pressure.

Chart II (continued). Example CAM Illustration

EXAMPLE COMPLIANCE ASSURANCE MONITORING PLAN: FABRIC FILTER FOR PM CONTROL

II. Monitoring Approach

The key elements of the monitoring approach are presented below:

A. Indicator

Visible emissions will be used as an indicator.

B. Measurement Approach

Visible emissions from the baghouse exhaust will be monitored daily using EPA Reference Method 22-like procedures.

C. Indicator Range

The indicator level is no visible emissions.

D. QIP Threshold

The QIP threshold is five excursions in a six month reporting period.

E. Performance Criteria

Data Representativeness:	Measurements are being made at the emission point.
Verification of Operational Status:	Not applicable.
QA / QC Practices and Criteria:	The observer will be a Method 22 trained observer and follow Method 22-like procedures.
Monitoring Frequency and Data Collection Procedure:	A six-minute Method 22-like observation will be performed daily.

Chart II (continued). Example CAM Illustration

EXAMPLE COMPLIANCE ASSURANCE MONITORING PLAN: FABRIC FILTER FOR PM CONTROL

III. Justification

A. Background

This facility manufactures particleboard. The pollutant-specific emission unit is the Line No. Sander, which is used to sand the particleboard to the customer's desired thickness. It is controlled by a Western Pneumatic pulse-jet baghouse with 542 bags, which filters approximately 50,000 ft^3 of air from the sander.

B. Rationale for Selection of Performance Indicator

Visible emissions was selected as the performance indicator because it is indicative of operation of the baghouse in a manner necessary to comply with the particulate emission standard. When the baghouse is operating properly, there will not be any visible emissions from the exhaust. Any increase in visible emissions indicates reduced performance of a particulate control device, therefore, the presence of visible emissions is used as a performance indicator.

C. Rationale for Selection of Indicator Level

The selected indicator range is no visible emissions. When an excursion occurs, corrective action will be initiated, beginning with an evaluation of the occurrence to determine the action required to correct the situation. All excursions will be documented and reported. An indicator range of no visible emissions was selected because: (1) an increase in visible emissions is indicative of an increase in particulate emissions; and (2) a monitoring technique which does not require a Method 9 certified observer is desired. Although RM 22 applies to fugitive sources, the visible/no visible emissions observation technique of RM-22 can be applied to ducted emissions; i.e., Method 22-like observations.

The selected QIP threshold for baghouse visible emissions is 5 excursions in a 6-month reporting period. This level is 3 percent of the total visible emissions observations. If the QIP threshold is exceeded in a semiannual reporting period, a QIP will be developed and implemented.

See the Technical Guidance Document on the EMTIC bulletin board on the TTN website at "http:\\134.67.104.12\html\emtic\cam.htm".

Question 8. How are CAM plans revised?

Response 8. CAM plans are to be revised in accordance with the permit modification processes given in parts 70 and 71. See section 8.2.1 of the Response to Comments document and section 64.7(e). Note that revisions to indicator ranges can occur without using the part 70 permits revision process, provided that the permittee has submitted and the permitting authority approved as part of the CAM plan an indicator or indicator range setting process. See section 64.4(a)(2).

Changes to the Operating Permit Programs Brought About by the CAM Rule

Question 9. What changes occur in parts 70.6 and 71.6 of the operating permit programs regulations?

Response 9. In order to better integrate the CAM rule with the operating permit programs regulations, the following changes were made to the permit content sections (70.6 and 71.6) of the operating permits program regulations:

a. Streamlining for monitoring and testing requirements is now contained in the regulation. Prior to this change, streamlining was allowed by policy via White Paper Number 2. See Chart III.

b. The revised language clarifies part 71's definition of deviation and states that a deviation is not always a violation. See Chart IV.

c. The revised language in sections 70.6(c) and 71.6(c) requires owners and operators to identify whether the data collection methods used to make the compliance certifications were continuous or intermittent, to identify the compliance status and to identify as possible exceptions to compliance any deviations, exceedences, or excursions. The former language required owners and operators to identify the compliance status and whether compliance was continuous or intermittent. The Agency believes these revisions provide permitting authorities and the public with more specific information concerning a source's compliance. See Chart V.

Chart III. Streamlining Language

Former language	Revised language
70.6(a)(3)(I)(A) - All emissions monitoring and analysis procedures or test methods required under the applicable requirements, including any procedures and methods promulgated pursuant to sections 114(a)(3) or 504(b) of the Act;	70.6(a)(3)(I)(A) - All monitoring and analysis procedures or test methods required under applicable monitoring and testing requirements, including part 64 of this chapter and any other procedures and methods that may be promulgated pursuant to sections 114(a)(3) or 504(b) of the Act. If more than one monitoring or testing requirement applies, the permit may specify a streamlined set of monitoring or testing provisions provided the specified monitoring or testing is adequate to assure compliance at least to the same extent as the monitoring or testing applicable requirements that are not included in the permit as a result of such streamlining;
71.6(a)(3)(I)(A) - All emissions monitoring and analysis procedures or test methods required under the applicable requirements, including any procedures and methods promulgated pursuant to sections 114(a)(3) or 504(b) of the Act;	71.6(a)(3)(I)(A) - All monitoring and analysis procedures or test methods required under applicable monitoring and testing requirements, including part 64 of this chapter and any other procedures and methods that may be promulgated pursuant to sections 114(a)(3) or 504(b) of the Act. If more than one monitoring or testing requirement applies, the permit may specify a streamlined set of monitoring or testing provisions provided the specified monitoring or testing is adequate to assure compliance at least to the same extent as the monitoring or testing applicable requirements that are not included in the permit as a result of such streamlining;

Chart IV. Definition of Deviation

Former language	Revised language
71.6(a)(3)(iii)(C) - For purposes of paragraph (a)(3)(iii)(B) of this section, deviation means any condition determined by observation, by data from any monitoring protocol, or by any other monitoring which is required by the permit that can be used to determine compliance, that identifies that an emission unit subject a part 71 permit term or condition has failed to meet an applicable emission limitation or standard or that a work practice was not complied with or completed. For a condition lasting more than 24 hours which constitutes a deviation, each 24 hour period is considered a separate deviation. Included in the meaning of deviation are any of the following: (1) A condition where emissions exceed an emission limitation or standard; (2) A condition where process or control device parameter values demonstrate that an emission limitation or standard has not been met; (3) Any other condition in which observations or data collected demonstrates noncompliance with an emission limitation or standard or any work practice standard or operating condition required by the permit.	71.6(a)(3)(iii)(C) - For purposes of paragraph (a)(3)(iii)(B) of this section, deviation means any situation in which an emissions unit fails to meet a permit term or condition. A deviation is not always a violation. A deviation can be determined by observation or through review of data obtained from any testing, monitoring, or recordkeeping established in accordance with paragraphs (a)(3)(i) and (a)(3)(ii) of this section. For a situation lasting more than 24 hours which constitutes a deviation, each 24 hour period is considered a separate deviation. Included in the meaning of deviation are any of the following: (1) A situation where emissions exceed an emission limitation or standard; (2) A situation where process or emissions control device parameter values indicate that an emission limitation or standard has not been met; (3) A situation in which observations or data collected demonstrates noncompliance with an emission limitation or standard or any work practice or operating condition required by the permit; (4) A situation in which an exceedance or an excursion, as defined in part 64 of this chapter, occurs.

Chart V. Compliance Certification Requirements

Former language	Revised language
70.6(c)(5)(iii) - A requirement that the compliance certification include the following: (A) The identification of each term that is the basis of the certification; (B) The compliance status; (C) Whether compliance was continuous or intermittent; (D) The method(s) used for determining the compliance status of the source, currently and over the reporting period consistent with paragraph (a)(3) of this section; and (E) Such other facts as the permitting authority may require to determine the compliance status of the source;	70.6(c)(5)(iii) - A requirement that the compliance certification include all of the following (provided that the identification of applicable information may cross-reference the permit or previous reports, as applicable): (A) The identification of each term or condition of the permit that is the basis of the certification; (B) The identification of the method(s) or other means used by the owner or operator for determining the compliance status with each term and condition during the certification period, and whether such methods or other means provide continuous or intermittent data. Such methods and other means shall include, at a minimum, the methods and means required under paragraph (a)(3) of this section. If necessary, the owner or operator also shall identify any other material information that must be included in the certification to comply with section 113(c)(2) of the Act, which prohibits knowingly making a false certification or omitting material information; (C) The status of compliance with the terms and conditions of the permit for the period covered by the certification, based on the method or means designated in paragraph (c)(5)(iii)(B) of this section. The certification shall identify each deviation and take it into account in the compliance certification. The certification shall also identify as possible exceptions to compliance any periods during which compliance is required and in which an excursion or exceedance as defined under part 64 of this chapter occurred; and (D) Such other facts as the permitting authority may require to determine the compliance status of the source.

Chart V (continued). Compliance Certification Requirements

Former language	Revised language
71.6(c)(5)(iii) - A requirement that the compliance certification include the following: (A) The identification of each term that is the basis of the certification; (B) The compliance status; (C) Whether compliance was continuous or intermittent; (D) The method(s) used for determining the compliance status of the source, currently and over the reporting period consistent with paragraph (a)(3) of this section; and (E) Such other facts as the permitting authority may require to determine the compliance status of the source;	71.6(c)(5)(iii) - A requirement that the compliance certification include all of the following (provided that the identification of applicable information may cross-reference the permit or previous reports, as applicable): (A) The identification of each term or condition of the permit that is the basis of the certification; (B) The identification of the method(s) or other means used by the owner or operator for determining the compliance status with each term and condition during the certification period, and whether such methods or other means provide continuous or intermittent data. Such methods and other means shall include, at a minimum, the methods and means required under paragraph (a)(3) of this section. If necessary, the owner or operator also shall identify any other material information that must be included in the certification to comply with section 113(c)(2) of the Act, which prohibits knowingly making a false certification or omitting material information; (C) The status of compliance with the terms and conditions of the permit for the period covered by the certification, based on the method or means designated in paragraph (c)(5)(iii)(B) of this section. The certification shall identify each deviation and take it into account in the compliance certification; and (D) Such other facts as the permitting authority may require to determine the compliance status of the source.

Question 10. Will permitting authorities have to revise their programs to incorporate these changes? If so, when?

Response 10. Yes, permitting authorities will need to revise their operating permit programs to incorporate these changes. However, in order to minimize the need for program revisions, permitting authorities may make these changes in conjunction with changes made to gain full approval of their program or in conjunction with changes made pursuant to the permit modification section of part 70. Until the operating permit programs are revised and already-issued permits are renewed, permitting authorities should allow use of either the former or revised language.

Question 11. Will existing title V permits have to be reopened?

Response 11. No, unless a proposed change to the permit would need to use the significant revision track or unless the permit is reopened for cause. However, only those units subject to the change or reopening would be required to apply for, and obtain approved, CAM plans. See sections 65.4(a)(2) and (c).

Question 12. Will existing permit applications have to be revised?

Response 12. No, unless the permit applications are not found or deemed complete by April 20, 1998. See section 64.5(a)(1). Based upon title V application statistical data compiled in August 1997, about 8,000 permit applications - or about thirty-six percent of the expected total - had not been submitted.

Question 13. Will permitting authorities have to adopt delegation of the CAM rule before their permits contain CAM?

Response 13. No. Existing programs should include provisions granting general authority to implement the CAM rule. In order to receive interim or full approval for their operating permit programs - and all programs have received either interim or full approval - permitting authorities were required to demonstrate that they had adequate legal authority to incorporate monitoring requirements, including requirements promulgated pursuant to sections 114(a)(3) or 504(b) of the Clean Air Act. Note that the CAM approach was developed to address these requirements of the Act. See sections 70.4(b)(3)(ii) and 70.6(a)(3)(i)(A) and 62 FR 54900. Moreover, the CAM rule provides a new set of applicable requirements, much like the requirements established by section 112(g)'s case-by-case MACT determinations. See Section 8.1.1 of the CAM Response to Comment Document.

Question 14. What would a permitting authority do if a "possible exception to compliance" is reported?

Response 14. If a possible exception to compliance is reported to a permitting authority, the permitting authority should investigate to determine whether a violation occurred and potentially use the information to bring an enforcement action for a violation. Permittees are to make every effort to minimize any periods that exceedences, excursions, or deviations occur. See section 64.7(d). Should the permitting authority determine that the permittee has not reacted appropriately, the permitting authority can require the permittee to implement a Quality Improvement Plan, or QIP. A QIP shall include the procedures for evaluating control performance problems as well as improved preventive maintenance practices, process operation changes, improvements to control methods, and / or more frequent or improved monitoring. See section 64.8.

Question 15. What happens to part 70 monitoring (this includes periodic monitoring) for units subject to the CAM rule?

Response 15. Part 70 monitoring is replaced by CAM for those units subject to the CAM rule. Until CAM is in place, part 70 monitoring (including periodic monitoring) remains in effect. See sections 64.5(d) and 64.6(e)(1).

Question 16. What responsibility does the permitting authority have to ensure CAM is applied?

Response 16. The CAM rule does not require a permitting authority to develop CAM plans if a permit applicant fails to provide an approvable CAM plan. However, the CAM rule requires a permitting authority to provide monitoring that satisfies part 70 requirements and a compliance schedule for providing an approvable CAM plan within 180 days. See section 64.6(e). Note that if the owner or operator fails to provide an approvable CAM plan within that 180 day compliance schedule, the owner or operator is not in compliance with part 64. See section 64.6(e)(3).

Question 17. A unit is subject to a newly-promulgated MACT standard. The unit is part of a facility that is subject to title V (and has a part 70 permit) because the facility emits a criteria pollutant above the major source threshold. Is the unit exempt from the CAM rule, even if the MACT does not require monitoring for the criteria pollutant that makes the facility a major source?

Response 17. The CAM rule exemption for MACT rules applies only to monitoring for those MACT emission limits. That is, the CAM rule imposes no additional monitoring on the emission unit for showing compliance with MACT limits. This exemption does not extend to monitoring for compliance with other limitations that may also apply to that unit. However, the MACT monitoring may satisfy CAM requirements. This may often be the case when the MACT requires particulate or VOC control measures and the criteria pollutant is particulate or VOC. Note that the source owner must make this determination initially and indicate in the permit application that the existing monitoring satisfies CAM or propose additional monitoring to meet the CAM requirements for monitoring for compliance with the criteria pollutant limit.

Question 18. A source owner has submitted a permit application before April 20, 1998 and has received a completeness determination but no title V permit. If, before a permit is issued, a source owner makes a change that involves a large PSEU (a unit whose post control emissions exceed the major source threshold) and that would be considered significant under part 70 if a permit had been issued, would the large PSEU be subject to the CAM rule?

Response 18. Yes, the large PSEU would become subject to the CAM rule if the change could potentially affect the unit's compliance status and if the change is owner-initiated. Not all changes that would require a significant permit revision trigger CAM rule applicability. The types of changes that could trigger CAM rule applicability include source owner- or operator-initiated physical changes such as increasing production rate, changing to a new fuel or raw material, adding a new process line or control device, increasing the load on the control device by routing additional process exhaust to it, changing the control device, installing new monitoring systems, or changing process or weight rates. Note that submission of supplementary facts, corrected information, or additional information as to new requirements, as those terms are used in 40 CFR sections 70.5(a)(2) and 70.5(b), after receipt of a completeness determination would not trigger CAM rule applicability.

Question 19. New Source Performance Standards (NSPS) usually refer to a unit's design capacity, not to a unit's potential to emit. For CAM rule applicability purposes, is a unit's design capacity (as expressed in an NSPS promulgated before 11/15/90) irrelevant except as it relates to calculating the unit's potential to emit?

Response 19. The CAM rule relies on part 70's definition of potential to emit, as given in section 70.2. Note that design capacity as defined by a rule (e.g., NSPS) probably has limited usefulness in determining potential to emit. In addition, note that the CAM rule applicability process is not intended to establish a hierarchy based on design capacity or any other factor.

Question 20. Do fugitive emissions count towards a PSEU's potential to emit?

Response 20. Fugitive emissions count toward potential to emit in the same manner used for making title V applicability determinations. This means that, in general, fugitive emissions are not considered unless the major source belongs to one of twenty-seven categories of stationary source. See the definitions of the terms "Fugitive emissions," "Major source," and "Potential to emit" given in 40 CFR section 70.2. If fugitive emissions are included in the title V applicability determination, then they count towards a PSEU's potential to emit. Otherwise, they do not count towards a PSEU's potential to emit.

Question 21. Will emission units subject only to process weight rate limitations be subject to the CAM rule?

Response 21. Yes, these units would be subject to the CAM rule if the other CAM applicability criteria, given below, are met:

a. the unit must be located at a major source subject to a Title V permit,

b. the unit must have a control device necessary to meet the process weight rate limit, and

c. the pre-control device emissions of the regulated pollutant must exceed or be equivalent to the major source size threshold.

Question 22. A PSEU with a control device has potential fugitive emissions. In order to determine whether the PSEU is large or other, would one exclude or include the amount of fugitive emissions from the control device?

Response 22. The calculation of pre-control emissions for determining CAM rule applicability is based on the total emissions of the regulated pollutant from the affected unit. The calculation can, and most frequently will, be based on emission factors. This means that pre-control emissions are to include all potential emissions including any fugitive emissions not captured by the control device. Note that source owners or permitting authorities are not expected to conduct emission testing for CAM rule applicability purposes; they only need to remove the design efficiency of the control device from the calculation of the applicable unit's potential to emit. See 62 FR 54914.

Question 23. Can a video or infrared camera substitute for a thermocouple for detecting the presence of a pilot flame?

Response 23. Use of a video camera, by itself, is not a good substitute for detecting the presence of a pilot flame. Note that the Office of Enforcement and Compliance Assurance has given approval for alternative monitoring which included a thermocouple to monitor the flame and a "closed circuit camera" to provide 24 hour surveillance of a steam-assisted flare system. The Emissions Measurement Center (EMC) is reviewing a similar monitoring approach to determine if it can be used to meet the CAM requirements. That approach involves both a thermocouple, which would provide indication of flame presence, and a video camera, which would monitor visible emissions. The review should be completed and available in a few months. Use of an infrared camera to detect the presence of a flame is an option worth pursuing; the EMC will review any proposal of such monitoring.

Question 24. What is the status of the legal challenge to the CAM rule?

Response 24. The Court granted industry's request for a delay in the CAM rule challenge briefing schedule until after the decision in the credible evidence rule case. Since the Agency received a decision on the credible evidence rule case on August 14, 1998, one can expect the CAM rule case to be briefed and argued over the fall and winter. Meanwhile, the CAM rule remains in effect.

Question 25. A permitting authority already has full approval for its part 70 program. What is the deadline for the permitting authority to make the part 70 revisions that accompanied promulgation of the CAM rule?

Response 25. As mentioned in Response 10, while all programs will need to be revised to incorporate the part 70 changes that accompanied the CAM rule, permitting authorities have flexibility as to when those changes must occur. Permitting authorities can make the changes in accordance with the existing program revision procedures given in section 70.4(i). Permitting authorities with interim approval can submit the requisite changes as part of their full approval package. Permitting authorities can also wait to submit the changes in conjunction with the changes contained in the upcoming revisions to section 70.7. The Agency expects all changes due to its rulemaking to be competed on or before the revisions to section 70.7 are done.

Question 26. Is the Agency conducting any studies to develop a technical illustration for an electrostatic precipitator?

Response 26. No. While the Agency is not conducting any studies to develop an example for an electrostatic precipitator, the Agency plans on obtaining information from an Electric Power Research Institute (EPRI) study of electrostatic precipitators. In early June, EPRI is initiating its study of equipment performance relative to compliance. The study may also include installation and testing of particulate matter continuous emissions monitoring systems.

Question 27. A source owner has submitted its title V application and received its completeness determination before April 20, 1998, so that the large size PSEU does not require CAM plan submittal at time of application submittal. During the permit negotiations, the permitting authority requests that the monitoring be changed to the extent that it would be considered a significant revision. Does the significant revision trigger CAM Plan submittal for the large size PSEU?

Response 27. As mentioned in Response 18, this proposed permit revision would not trigger CAM requirements because the change request was initiated by the permitting authority, not the source.

Question 28. A permitting authority requests source owners not to include CAM plan interim monitoring details in the initial applications until periodic monitoring guidance is issued by EPA. After the periodic monitoring guidance is issued, does the updating of permit applications with monitoring information trigger CAM plan submittal of applicable large size PSEUs?

Response 28. As mentioned in Response 18, updating of permit applications (i.e., submitting supplementary facts) due to permitting authority-initiated changes does not trigger CAM applicability of large PSEUs. Note that if a source owner has a complete permit application by April 20, 1998, the source owner need not address CAM requirements until the applicability date given in the rule. In the meantime, source owners or operators and permitting authorities can use CAM principles or other monitoring to satisfy part 70 periodic monitoring requirements, consistent with the Agency's periodic monitoring guidance.

Question 29. An owner of a source submits a part 70 permit application update containing a change to a large PSEU that would constitute a significant permit revision if a part 70 permit had been issued; however, the change would not affect the interim monitoring for that PSEU. Without the owner initiated change, the PSEU would have become subject to the CAM rule at permit renewal. Does an owner-initiated change which would require use of the part 70 significant revision process but that has no impact on monitoring for a large PSEU trigger CAM rule applicability?

Response 29. As mentioned in Response 18, not all changes that would require a significant permit revision trigger CAM rule applicability. The Agency plans on issuing a separate piece of guidance to identify those changes that would trigger CAM applicability. In general, the changes that are owner-initiated and that would potentially affect compliance or compliance determination (i.e., monitoring) would include changes such as adding a new unit, increasing production rate, changing fuel or raw material composition, modifying the monitoring technique, adding a new process line or control device, increasing the load on the control device by routing additional process exhaust to it, changing the control device, changing monitoring systems, or changing to process or weight rates. Note that while changes initiated by permitting authorities may require application and/or permit revisions, those changes do not trigger CAM applicability.

Question 30. A PSEU has a continuous emission monitoring system (CEMS) for nitrogen oxides, and the CEMS collects a data point every fifteen minutes. The underlying standard for nitrogen oxides lacks a data averaging period. Given that the monitoring frequency is four times per hour and that the data averaging period is not addressed, does one assume that the CEMS provides intermittent monitoring and that the standard requires instantaneous compliance?

Response 30. This hypothetical situation seems unlikely. First, CEMS operating in accordance with requirements in 40 CFR 60.13 and PS-2, i.e., providing a data point at least every fifteen minutes, supply data on a frequency consistent with the frequency established by the Agency for a continuous monitoring system. See 62 FR 54922. Second, few, if any, nitrogen oxides emissions limits exist that do not rely on a default data averaging period which is based on a "3-hour" average required by Method 7 (or 7E) performance testing. Appropriate monitoring for the hypothetical situation becomes apparent once the permit applicant or permitting authority identifies (as required by the periodic monitoring requirement of part 70 or 71) an averaging time consistent with the compliance limit.

Question 31. Consider a PSEU which uses a CEMS for monitoring nitrogen oxides emissions. The nitrogen oxides emissions limit has a two-hour averaging period. Since the CEMS collects data every fifteen minutes and since the monitoring frequency is well within the data averaging period, does the CEMS provide continuous monitoring?

Response 31. As mentioned in Response 30, a CEMS operated in accordance with the requirements of 40 CFR 60.13 and PS-2 yields continuous data. Since the frequency of data collection is compatible with the averaging time of the nitrogen oxides emission limit, the CEMS provide continuous monitoring.

Question 32. A boiler has a volatile organic compound emissions limit with a three-hour data averaging period. The boiler collects data from an operating parameter once per hour. Would such monitoring represent continuous monitoring for non-large PSEUs? Given that the CAM rule requires a data collection frequency of at least every fifteen minutes for large PSEUs, would such monitoring represent continuous monitoring for large PSEUs?

Response 32. Since 40 CFR 64.3(b)(4)(i) requires data collection frequency intervals to be commensurate with the time period over which a change in control device performance that would require actions by the owner or operator to return operations within normal ranges or designated conditions is likely to be observed and since a data collection frequency of once per hour appears compatible with a three-hour data averaging period and with the minimum data collection frequency of once per day required for non-large PSEUs, such monitoring could represent continuous monitoring for non-large PSEUs. However, since the data collection frequency of once per hour is not compatible with the minimum data collection frequency of at least every fifteen minutes required for large PSEUs, such monitoring would not represent continuous monitoring for large PSEUs, nor would it comply with CAM.

Question 33. A boiler has a volatile organic compound emissions limit with a data averaging period of four hours. A permit applicant proposes to monitor an operational parameter once per day, since the PSEU is not large. Would such monitoring represent intermittent monitoring because its frequency is not within the data averaging period?

Response 33. If one assumes that the data averaging period is established in the rule, then the monitoring frequency of once per day is insufficient for CAM purposes. Note that the CAM rule establishes minimum monitoring frequencies, meaning that those frequencies must be increased as necessary to be compatible with emission averaging times. One data point per day (and a daily average) may be sufficient depending on the control device, margin of compliance, particularly when the frequency is commensurate with the time period over which a change in control device performance that would require actions by the owner or operator to return operations within normal ranges or designated conditions is likely to be observed. See 40 CFR 64.3(b)(4)(i).

CAPCOA/CARB/EPA Region IX Periodic Monitoring Workgroup

Date: June 24, 1999

To: Interested Parties, District Title V Contacts

From: Rick McVaigh, CAPCOA Title V Subcommittee Chairperson

RE: **Approval of Title V Periodic Monitoring Recommendations**

The CAPCOA/CARB/EPA Region IX periodic monitoring workgoup has completed its development of the attached Periodic Monitoring Recommendations for Generally Applicable Requirements. These guidelines were developed by the workgroup to assist California applicants and permitting agencies in selecting approvable periodic monitoring proposals for Title V permits.

Draft periodic monitoring recommendations were prepared by workgroup members based on criteria established by the California Air Pollution Control Officers Association (CAPCOA) Title V subcommittee. The draft recommendations were presented in public workshops in Sacramento on April 16, 1999, and in Diamond Bar on May 4, 1999. All comments received before, during, and after the workshops have been addressed. On June 24, 1999, the CAPCOA Engineering Managers Committee approved the recommendations for distribution to district Title V contacts and interested parties.

On behalf of the workgroup members, I would like to thank those who provided input and assistance in the development of this important document. Questions regarding the development of these recommendations may be referred to Mr. Steven Barhite, U.S. EPA Region IX, at (415) 744-1260; or Ms. Beverly Werner, Air Resources Board, at (916) 322-3984. Further information regarding the application of these recommendations may be obtained from your District, Air Resources Board, or U.S. EPA Title V contact persons.

CAPCOA/CARB/EPA Region IX Periodic Monitoring Workgroup

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June 24, 1999
Summary
Periodic Monitoring Recommendations
For Generally Applicable Requirements in SIP

Note: General guidelines. May be case-specific deviations where alternative monitoring is more appropriate.[1] [2]

Requirement/Equipment	Recommended Periodic Monitoring	Notes
I. Opacity Limits (Assuming SIP limits of 20-40%)		
I.A.1. Gaseous-fueled combustion equipment (except flares).	A.2. None when unit is firing on gaseous fuel.	
I.B.1. Ground-level flares at landfills	B.2.a Minimum Acceptable Monitoring: Continuous exhaust temperature limit/monitoring, either with continuous recorder or emergency shut off with alarm if combustion temperature falls out of specified range. B.2.b. Also acceptable: Automatic combustion air controller with alarm and automatic shutoff valve for the case of existing flare systems which already have this capability.	Monitoring not required during start-up, to allow flare to come up to temperature. Start up to be defined in permit. Start up period is typically 15 minutes.
I.C.1. Ground-level flares at waste water treatment plants	C.2.a Minimum Acceptable Monitoring: Continuous exhaust temperature limit/monitoring with continuous recorder or emergency alarm if combustion temperature falls out of specified range. Alarm will trigger an immediate visible emissions inspection. If a visible emissions inspection documents opacity, a method 9 evaluation shall be completed within 3 working days.	Monitoring not required during start-up, to allow flare to come up to temperature. Start up to be defined in permit. Start up period is typically 15 minutes.

Requirement/Equipment	Recommended Periodic Monitoring	Notes
I.D.1. Elevated Refinery Flares	D.2. Minimum Acceptable Monitoring: either a) Visible emissions inspection via remote viewing system, supplemented by recordkeeping of instances in which unable to correct visible emissions problems. OR b) Visible emissions inspection as soon as any intentional or unintentional release of vent gas to a gas flare but no later than one hour from the flaring event, OR c) For clean service flares, monitoring will consist of monitoring of gas quality or other demonstration of gas quality.	"Clean service" is a gas flare that is designed and configured by installation to combust only natural gas, hydrogen gas, and/or liquified petroleum gas.
I.E.1. Elevated and Ground Level Oil Field Flares	E.2.a. For high quality gas: If source submits data documenting that the quality of the gas over its range of variability would meet the definition of high quality gas, monitoring will consist of monitoring for gas quality or other demonstration of gas quality. E.2.b. For other gas: still under discussion Option: Monitoring similar to refinery flares. Alternative to the refinery flare monitoring may be proposed for remote locations (e.g., to reduce cost, monitoring could be conducted during times when flares are normally otherwise inspected/maintained by the facility.)	"High quality" means gas with high methane content and low heavy hydrocarbon content. More specific definition may be developed later based on District data. More work on oil field gas composition necessary (review data from San Joaquin and Ventura).
I.F.1. Stack emissions from material handling units such as aggregate plants, asphalt batch plants, lime plants, kilns, Portland cement plants, and dry materials handling equipment. **Baghouses -- based on potential**	F.2.a. Minimum Acceptable Monitoring: 1. Visible emissions inspection to detect any visible emissions at following frequency (pressure drop monitoring may be substituted for visible emissions inspection.):	

Requirement/Equipment	Recommended Periodic Monitoring	Notes
uncontrolled particulate matter emissions per baghouse	Uncontrolled PTE — Monitoring Frequency < 25 TPY — Annual 25 to 300 TPY — Quarterly >300 to 1,300 TPY — Monthly >1,300 TPY — Weekly Case by case consideration can be given to modifying the above monitoring frequencies to deal with special situations, or for multiple baghouses where a consistent frequency would provide for better overall monitoring, without loss of adequate compliance assurance. AND 2. Baghouse to be completely inspected annually. F.2.b. Also acceptable: COMS or triboelectric monitoring.	
I.G.1. Stack emissions from material handling units such as aggregate plants, asphalt batch plants, lime plants, kilns, Portland cement plants, and dry materials handling equipment. **Vent Filters**	G.2.a. Receiving Silos 1. Perform visible emissions inspection and record results annually. If any VE are observed, corrective action is required prior to further loading. Corrective action means that VE is eliminated before next loading event. 2 Maintain all records of vent filter maintenance. G.2.b. Process Silos (Silos continuously loaded during process operation.) 1. Perform visible emissions inspection and record results on a quarterly basis. If any VE are observed, immediate corrective action (within 24 hours, or another	Monitoring frequency may be linked to size consistent with frequencies in I.E.2.a.

Requirement/Equipment	Recommended Periodic Monitoring	Notes
	specified time frame consistent with SIP-approved District rule) is required. Corrective action means that the VE is eliminated. 2. Inspect filter bags for scuffs, wear, holes, tears, etc. and all connection points, hatches etc. on an annual basis.	
I.H.1. Stack emissions from material handling units such as aggregate plants, asphalt batch plants, lime plants, kilns, Portland cement plants, and dry materials handling equipment. **Scrubbers** [Based on scrubber with exhaust flow of 7,500 cfm.]	H.2.Weekly records of pressure drop and scrubbing liquid flow rate, and weekly visual qualitative check to make sure settling pond is working adequately.	
I.I.1. Stack emissions from material handling units such as aggregate plants, asphalt batch plants, lime plants, kilns, Portland cement plants, and dry materials handling equipment. **Cyclones**	I.2. Case-by-case basis.	May be revisited at later date.
I.J.1. Fugitive emissions from process transfer points at material handling units such as aggregate plants, asphalt batch plants, lime plants, kilns, Portland cement plants, and dry materials handling equipment. Grain loading limits are not applicable to fugitive (non-stack discharge) emissions, however, process weight rate limits are applicable to fugitive emissions. **Totally enclosed systems**	J.2. Annual inspection of enclosure.	

Requirement/Equipment	Recommended Periodic Monitoring	Notes
I.K.1. Fugitive emissions from process transfer points at material handling units such as aggregate plants, asphalt batch plants, lime plants, kilns, Portland cement plants, and dry materials handling equipment. Grain loading limits are not applicable to fugitive (non-stack discharge) emissions, however, process weight rate limits are applicable to fugitive emissions. **Fugitive emissions (no spraybars)**	K.2. Annual visible emissions inspection under material and environmental conditions (e.g. dry and/or windy) where high emissions expected.	May still need to discuss what would be required as a follow-up action if visible emissions are documented during annual inspection.
I.L.1. Fugitive emissions from process transfer points at material handling units such as aggregate plants, asphalt batch plants, lime plants, kilns, Portland cement plants, and dry materials handling equipment. Grain loading limits are not applicable to fugitive (non-stack discharge) emissions, however, process weight rate limits are applicable to fugitive emissions. **Fugitive emissions (controlled by spraybars)**	L.2. Case-by-case basis	
I.M.1. Gas turbine [based on example turbine of 941 mmbtu/hr]	M.2. Annual visible emissions inspection if the unit is fired on diesel fuel for training/testing purposes; and A visible emissions inspection after every 400 cumulative hours of operation on diesel fuel or after every 2 million gallons of diesel fuel combusted, to be counted cumulatively over a 5 year period. If a visible emissions inspection documents opacity, a method 9 evaluation shall be completed within 3 working days, or during the next scheduled training/testing period if the unit ceases firing on diesel fuel within the 3 working day time frame.	Monitoring frequency can be scaled similar to the scaling for monitoring frequency for boilers in I.O.2. For sources keeping records of fuel use rather than hours of operation, monitoring frequency could be based on the cumulative amount of fuel combusted; Hours of operation could be converted to gallons fuel

Requirement/Equipment	Recommended Periodic Monitoring	Notes
		combusted based on the maximum gallons fuel combusted per hour by a specific emissions unit.
I.N.1. Reciprocating engines equal or greater than 1000 horsepower, firing on only diesel with no restrictions on operation	N.2. Quarterly Method 9 or a visible emissions inspection that triggers a Method 9 within 3 working days, or during the next scheduled training/testing period if the unit ceases firing on fuel oil within the 3 working day time frame.	
I.O.1. Diesel Standby and emergency reciprocating engines	O.2. No monitoring for opacity.	This monitoring applies to any CA sources firing on diesel fuel, based on consideration that sources in CA usually combust CA diesel or other low-sulfur, low aromatic diesel fuels.
I.P.1. Diesel/Distillate-Fueled Boilers	P.2. A visible emissions inspection after every 1 million gallons diesel combusted, to be counted cumulatively over a 5 year period. If a visible emissions inspection documents opacity, a method 9 evaluation shall be completed within 3 working days, or during the next scheduled operating period if the unit ceases firing on diesel fuel within the 3 working day time frame.	This monitoring applies to any CA sources firing on diesel fuel, based on consideration that sources in CA usually combust CA diesel or other low-sulfur, low aromatic diesel fuels. For sources keeping records of hours of operation rather than fuel use, monitoring frequency could be based on the cumulative hours of operation; Fuel use could be converted to hours of operation based on the maximum gallons fuel combusted per hour by a specific

Requirement/Equipment	Recommended Periodic Monitoring	Notes
		emissions unit.
II. Grain Loading [Assuming SIP limits 0.1 gr/dscf or higher] and Process Weight		
II.A.1. Stack emissions from material handling units such as aggregate plants, asphalt batch plants, lime plants, kilns, Portland cement plants, and dry materials handling equipment.	A.2. See monitoring for I.F. through I.I. above.	
II.B.1. Fugitive emissions from process transfer points at material handling units such as aggregate plants, asphalt batch plants, lime plants, kilns, Portland cement plants, and dry materials handling equipment. Grain loading limits are not applicable to fugitive (non-stack discharge) emissions, however, process weight rate limits are applicable to fugitive emissions.	B.2. See monitoring for I.J through I.L above.	
III. Sulfur Content of Fuels		
III.A.1. PUC quality natural gas / propane / butane / ARB quality reformulated gasoline / ARB (or EPA) certified diesel	A.2. None when unit is firing on one of fuels listed under III.A.1.	
III.B.1. Landfill gas	B.2.a. For limits >=750 ppm as H2S or 160 ppm as SO2, test landfill gas quarterly using Draeger tubes. If source-specific historical data shows seasonal variation is minimal, then test landfill gas annually using Draeger tubes. B.2.b. If there is control equipment for purposes of	For new landfills, permit could provide for reducing quarterly monitoring frequency after data has been collected to show emissions variation is minimal.

Requirement/Equipment	Recommended Periodic Monitoring	Notes
	meeting the limit, periodic monitoring of the control equipment.	
III.C.1. Sewage Digester gas	C.2. For all limits, test weekly using Draeger tubes (or equivalent method) to measure sulfur content of gas. If source-specific historical data shows emissions are well below the applicable limit with minimal variation, then test (less frequently) using Draeger tubes.	If data is available to show emissions well below applicable limits, would consider different monitoring for this limit. Also, permit could provide for reducing monitoring frequency after data has been collected to show emissions variation is minimal.
III.D.1. Oil field gas	D.2.a. Dependent on oil field sulfur, to be determined during permit preparation or through periodic monitoring: If sweet gas, annual monitoring, otherwise If pre-control S levels <50% of limit, annual monitoring 50-80% of limit, semi-annual monitoring 80-100% of limit, quarterly monitoring D.2.b. If pre-control S levels >100% of limit, periodic monitoring of the control equipment.	Would like to include oil field test data from Districts as supporting information.
III.E.1. Other gaseous or liquid fuels not addressed by III.A. through D above	E.2. Certification by fuel supplier for each fuel delivery. Certification may be provided once for each purchase lot, if records are also kept of the purchase lot number of each delivery.	Title IV (acid rain) monitoring requirements could also serve as adequate periodic monitoring

Requirement/Equipment	Recommended Periodic Monitoring	Notes
IV. Specific Contaminants (e.g. CO, SO2, PM)		
IV.A.1. Emission limits for common pollutants, applicable to broad range of combustion equipment	A.2. For SO2 concentration, monitor fuel sulfur content as a surrogate. For limits covered by section III above, do monitoring as specified in that section. For other limits, set monitoring frequency on a case-by-case basis.	

1. Monitoring shall be the responsibility of the source. However, a visible emissions inspection or Method 9 conducted by a District inspector may be counted as meeting the requirement for the source to conduct same if the information and records generated by the inspector meets the requirements of the permit and a copy of the records are maintained by the source consistent with Title V recordkeeping requirements.

2. In addition to the monitoring identified in the specific monitoring recommendations, Title V permits will also include recordkeeping provisions associated with the monitoring requirements. Records will generally include information such as:

- identification of the stack or emission point being monitored;
- the operating conditions at the time of monitoring;
- records of any monitoring conducted, including records of emission or parameter values, and the date, place and time of sampling or measurement.
- where corrective action is triggered, description of the corrective action, and the date, time, and results of any corrective action.

DRAFT
Process for Establishing Appropriate MRR for Title V Permitting

The goal of this process is to determine the most appropriate monitoring, recordkeeping, and reporting requirements for each source category considering: 1) Source Size; 2) Burden/Cost; 3) Reasonableness; 4) Consistency; 5) Compliance Assurance; 6) Compliance Margin; and 7) Variability. To identify the most appropriate monitoring, the following steps are being followed:

1. **Define Source Categories and Subcategories** - In the first phase, the group attempts to clearly define the source category or subcategory to be investigated. If a category contains different emitting processes or controls, the category should be broken up into subcategories.

For particulate emissions from material handling operations, for example, five subcategories were initially identified as different emitting processes. These were:

a. Baghouses
b. Vent filters
c. Fugitive Emissions
d. Cyclones
e. Scrubbers

Other differences that may ultimately warrant different MRR strategies may also be used to separate source categories into rational subcategories. Vent filters, for example, were further divided into two subcategories based on whether their operation was continuous or intermittent.

2. **Preliminary Investigation** – The next step toward establishing appropriate monitoring is for members of the group to discuss their understanding of the emissions processes and applicable requirements. The group may identify the need for additional information about the emitting processes or applicable requirements at this point.

One way to obtain additional information about emission units is to review standard reference materials. Another is to talk to experienced District Staff, CARB Staff, EPA staff, and source operators. By reaching a common understanding of the emitting processes and applicable requirements early, the group can avoid conflicts later.

3. **Identify Example Sources** – It is also helpful to perform analyses in the context of real world examples. District permit files contain information on thousands of actual source operations that may be used as examples.

The group should attempt to reach consensus that the examples are indeed representative. If the group cannot agree that the examples are representative, additional alternative examples should be identified.

For particulate emissions Material Handling emissions from baghouses, the group focussed on one large mineral processing operation in the South Coast AQMD.
The following information is generally useful for each example:

a. Facility Name
b. Facility Type
c. Description of Emitting Operation including information regarding equipment type, equipment size, ratings, fuels, materials, control equipment, etc..
d. Description of the Existing Monitoring
e. Compliance Data from source tests, engineering evaluations, etc.
f. Emissions data
g. Emission Limit
h. Margin of Compliance

4. **Identifying Causes of Variation** - Whenever possible, the group should identify any causes of excessive variability or noncompliance. Experienced District Staff, CARB Staff, EPA staff, and source operators may be able to help identify causes of variation.

For particulate emissions Material Handling emissions from baghouses, for example, failure of filter bags due to holes, tears, etc. was identified as the primary cause of noncompliance with opacity requirements and generic emission limits. This led the group toward considering parametric monitoring schemes that would identify bag leaks.

Again, it is important that the group achieve consensus on the validity of these determinations.

5. **Data Collection** – Although looking at one specific example is useful when analyzing monitoring needs, one example generally will not provide enough information regarding variability. This information may be obtained by reviewing source test data, reviewing compliance records, and by talking to experienced compliance or operations people.

6. **Brainstorm Possible MRR Types** – Next, the group should brainstorm potential monitoring proposals. Ideas for monitoring proposals may come from experience, be developed by applying technologies used for similar source categories, or they may be innovative.

For particulate emissions Material Handling emissions from baghouses, emissions calculation, one- time sources test, several parametric monitoring

schemes, annual source testing triboelectric monitoring, and continuous opacity monitors were identified as potential candidates.

7. **Develop an Options Table for Each Example** - The options table should contain one row for each potential monitoring option and the following five columns:

a) Monitoring Type – Briefly describe each monitoring option (e.g. one-time sources test, monthly opacity test by EPA method 9, etc.)

b) Cost – The estimated annual cost (or one-time cost) of performing the monitoring. Monitoring costs have been obtained from vendors, estimation programs, literature, and knowledgeable staff.

c) Reasonableness – For each monitoring option, the technical feasibility and burden to the permitting agency should be addressed under this heading.

d) Consistency – The consistency with existing regulations and permitting practices in California and in other regions is evaluated here.

e) Compliance – This section is used to address compliance assurance, margin of compliance and variability. One key question to be answered here is: "To what extent will the proposed monitoring method provide data for evaluating compliance on an ongoing basis?" Other relevant information may also be included.

An example options table from the Material Handling Group is attached.

8. **Review options Table** – The group should review the options table and openly discuss the relative merits of each option.

9. **Choose MRR Method and Frequency**- Choose the most appropriate monitoring method and frequency from the options table. Some of the criteria, such as technical feasibility and data necessary to determine compliance on an ongoing basis, are go/no go criteria. The group cannot choose a monitoring method that is not technologically feasible, or that will not provide necessary data. For other criteria such as cost and consistency, there is not a go/no go threshold. The group must consider the relative merits of each option with respect the criteria. If consensus cannot be reached based on the existing information in the options table, more data/information may be collected.

10. **Evaluate the Scope to the Determination** - The group must decide the scope of the determination (how it extends to other sources in the category). This may be accomplished by placing size or throughput limits on the determination, and identifying any exceptions where the determination may not apply and a different monitoring method or frequency is appropriate.

Example

Analysis of MRR options for Vent Filters

Monitoring Type	Cost (per unit)	Reasonableness	Consistency	Compliance
Calculation	Negligible	Technologically Feasible. Little or no additional burden to Permitting agency.	Routinely performed as part of District Evaluation for new and modified sources.	Would not provide ongoing data for compliance by detecting bag failures.
One-time Source Test	$5000 (One-time Expense) plus cost to modify vent system for test.	Not Technologically Feasible without major modifications to equipment. Permitting Agency would need to review source test protocol, data, and observe source test.	Not required by any existing rules, regulations or under current permits	Would not provide data for ongoing compliance by detecting bag failures.
Ongoing Parametric Daily VE Check, Daily Pressure Drop Monthly Inspection, Monthly Check for Fugitives Quarterly VE Check, Annual bag Inspection, Annual inspection for fugitives. Annual VE Check, Annual bag Inspection, Annual inspection for fugitives.	 $4,998/yr $310/yr $288/yr	Parametric Monitoring can only occur during loading operation, which may occur infrequently. Permitting Agency would need to review records, deviation reports, etc.	Not required by any existing rules or regulations. Has been required under some current permits.	Would provide data for ongoing compliance by detecting bag failures.
Leak Detection Systems	$3000/year plus cost to modify vent system.	Not technologically feasible without equipment modifications. Permitting Agency would need to review records, deviation reports, etc.	Required by some MACT standards for HAPs. (e.g. Lead Smelting Operations)	Would provide data for ongoing compliance by detecting bag failures at time of occurrence.
Annual Source Test	$5000/yr plus cost to modify vent system for test.	Not Technologically Feasible without major modifications to equipment. Permitting Agency would need to review source test protocol, data, and observe source test.	Not required by any existing rules, regulations or under current permits	Would not provide ongoing data for compliance by detecting bag failures.
COMS	Very High.	Not Technologically Feasible without major modifications to equipment.	Not required by any existing rules, regulations or under current permits	Would provide data for ongoing compliance by detecting bag failures at time of occurrence.

All casual VE estimates assume $100 annual training cost & 0.125 hours per test @ $60/Hr
Vent Filter Inspections assume 2 hr @ $60/Hr
Fugitive Inspections assume 1 hr @ $60/Hr

Periodic Monitoring Workgroup
Notes from October 9, 1998 Meeting

Consensus Criteria - Definitions

Criteria will be used to develop monitoring for source categories, exceptions, and sources not covered in guidelines (group may revisit other possible uses).

Compliance Assurance

Monitoring that assures compliance is designed to
1) Monitor key parameters which determine compliance
2) Be done at a frequency consistent with the likely variability of emissions and margin of compliance
3) Detect deviations within specific time limits (provide information to operator to correct problems promptly)
4) Provide information that public could use for direct enforcement

Margin of Compliance

1) Amount of monitoring varies based on how unit is operating with respect to emission limits (x% of emission limit); less monitoring if there is a comfortable margin of compliance.

2) In determining margin of compliance, consider accuracy of emission estimation method -- less monitoring if reliable emission factors exist. Consider
- a) Reference method accuracy range e.g. 10% error, and below 90% of limit
- b) AP-42 or other emission factor accuracy e.g. rating and range of emission factor

3) Consider existence of control equipment

Variability

1) Look at emissions over time under normal/upset conditions (within an individual unit)
- a) More variability more monitoring; less variability less monitoring
- b) Variability within margin of compliance is O.K.

20 Also consider variability
- a) Within a source category
- b) Caused by equipment failure or degradation
  - e.g. less ongoing MRR for units without external control devices

Source Size

Vary monitoring based on unit size as a lb/day or ton/year threshold based on potential

uncontrolled emissions, e.g. more monitoring if uncontrolled emissions exceed major source threshold.

Burden/Cost to Permittee

1) Cost of equipment, personnel (training, time spend on job, etc) administrative costs (e.g. time and expense of MRR), cost/ton
2) Consider the least cost monitoring method that meets other criteria; means of reducing burden/cost include
    a) Don't require substantial deviations from current unit operations
    b) Allow data from representative units to be used upfront to determine appropriate monitoring and on an ongoing basis to reduce monitoring costs

Reasonableness (Does it make sense?)

Examples
1) Burden on agency i.e. inspections, record review: Time to
    a) Implement condition
    b) Review condition
    c) Review data generated by condition
2) Technical feasibility of monitoring and test methods e.g. stack testing of fugitive emissions
3) Existing burden for monitoring

Consistency

Consistency means monitoring may be different but consistently meets the established criteria. Consistency is important between similar or identical sources e.g. with regard to size, source emission unit category, and emission limits.